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Continuous Glucose Monitoring

Is it useful in treatment with basal insulin or non-insulin medications

Continuous glucose monitoring (CGM) has revolutionized diabetes management by providing a detailed, real-time view of glucose levels. This allows both patients and health care professionals to adjust treatments with greater precision and proactivity, promoting more stable glycemic control and preventing episodes of hypoglycemia or hyperglycemia. CGM has proven to be especially valuable for patients with diabetes who require intensive insulin management. In these cases, glycemic control can be more unstable, making continuous monitoring essential for adjusting insulin doses based on real-time glucose levels. The data provided by CGM not only help correct episodes of hyperglycemia or hypoglycemia but also prevent them by enabling proactive dose adjustments, ultimately reducing short- and long-term complications.

However, in patients with diabetes who do not require intensive management, the question arises as to whether CGM can provide significant benefits. Basal insulin, designed to control fasting and between-meal glucose levels, provides a sustained release of insulin throughout the day. This means that in patients treated solely with this type of insulin, the risk of extreme glycemic fluctuations is lower compared to those using other insulin regimens, raising the question of whether CGM is necessary or cost-effective. On the other hand, the modernization of treatments and the expanded use of innovative drugs such as sodium-glucose cotransporter-2 inhibitors (SGLT2i) and glucagon-like peptide-1 receptor agonists (GLP-1 RA), which regulate glucose levels more physiologically with a low risk of hypoglycemia, also raise questions about the efficiency of continuous glucose monitoring in these patients. Is CGM a useful tool in this patient group, or is it better reserved for those requiring more intensive and complex management?

CGM IN PATIENTS ON BASAL INSULIN

Basal insulin is used to maintain stable glucose levels during fasting periods and between meals, providing a continuous release of insulin that meets the body's basic needs. Since it is not directly influenced by meals, it has been argued that CGM may not be necessary in these patients, as pronounced glycemic variability and sudden glucose changes throughout the day are not expected. However, recent studies have shown that CGM can be highly beneficial in this patient group.

A clinical trial published in JAMA in 2021, which included patients with type 2 diabetes mellitus and poor glycemic control treated solely with basal insulin, demonstrated that those using CGM achieved a significant improvement in their HbA1c after 8 months, compared to those using only capillary glucose monitoring. Additionally, CGM users spent more time within the target glucose range (70–180 mg/dL) and reduced time in hyperglycemia (>250 mg/dL) without increasing the risk of hypoglycemia.

CGM is particularly useful for uncovering nocturnal hypoglycemia, a problem that often goes unnoticed. This is especially relevant in elderly individuals, who are more vulnerable to the adverse effects of hypoglycemia, such as falls, fractures, cognitive impairment, and, in severe cases, death. The HYPOAGE trial revealed that 65% of patients older than 75 years with type 2 diabetes mellitus on insulin experienced nocturnal hypoglycemia that was undetected by traditional monitoring but was identified through CGM, allowing for treatment adjustments to prevent these episodes.

Additionally, another study on the feasibility of CGM use in older adults receiving home care showed that CGM was effective in detecting asymptomatic hypoglycemia in this group, with high acceptability of the technology among participants. The results indicated that CGM is an appropriate tool for identifying hypoglycemia episodes in elderly individuals living alone or with limited access to health care services, improving diabetes management safety at home and enabling personalized and secure treatment adjustments.

This body of evidence suggests that CGM is not only useful but essential in managing elderly patients treated with basal insulin, particularly those at higher risk of hypoglycemia, including those living alone or with cognitive impairment. By enabling continuous glucose monitoring, CGM provides a critical window for improving glycemic control, preventing severe complications, and making precise treatment adjustments.

CGM IN PATIENTS ON NON-INSULIN THERAPY

For patients with type 2 diabetes mellitus who do not require insulin, treatment is generally based on oral or injectable medications such as SGLT2 inhibitors, GLP-1 receptor agonists, or metformin. These drugs act without sharply increasing insulin levels, significantly reducing the risk of hypoglycemia (low blood sugar). For this reason, CGM has traditionally been considered less necessary in this group of patients.

However, recent studies have shown that, although the risk of hypoglycemia is low, CGM can be highly useful by detecting situations such as postprandial hyperglycemia (after meals), which might go unnoticed with traditional glucose meters. This facilitates more precise dietary and medica- »

ALTHOUGH CGM FACES ADOPTION BARRIERS, ITS ABILITY TO PERSONALIZE TREATMENT IS KEY FOR ANYONE WITH DIABETES

» tion adjustments, improving overall diabetes control.

A recent meta-analysis, which included six clinical studies with more than 400 patients, demonstrated that those using CGM reduced their HbA1c levels by a mean 0.3% vs those using only conventional glucose meters. Additionally, CGM users spent 8.6% more time within the optimal glucose range (70–180 mg/dL), indicating better daily disease management. Patients also reported greater treatment satisfaction, feeling more in control of their diabetes and experiencing increased safety.

LIMITATIONS AND CHALLENGES

Despite the potential benefits of CGM, there are important limitations to consider, especially in patients treated with non-insulin medications. One of the main challenges is the high cost. A recent cost analysis associated with CGM use in this patient profile showed that the annual cost per patient is significantly higher (> €1,100 per patient-year) compared to traditional capillary monitoring. However, some studies demonstrate that these systems are cost-effective, particularly due to the reduction in acute complications such as hypoglycemia.

Moreover, adherence to the technology can be a challenge, particularly in older patients or those less familiar with technological devices. CGM use requires proper sensor installation and maintenance, which may present a barrier for some patients. In this context, educational support is essential to ensure appropriate use of the technology, but such assistance is not always available and may also be costly.

Another factor to consider is information overload. CGM generates a large amount of real-time data, which can be overwhelming for some patients, especially those who do not require frequent treatment adjustments. In these cases, it is crucial to provide proper education on how to interpret CGM data and use it effectively to make informed decisions without overcorrecting. Patients on non-insulin drugs with a low risk of hypoglycemia may experience uncertainty when interpreting glucose fluctuations that do not require immediate action, potentially adding stress to their condition. D

CONCLUSIONS

CGM is a valuable tool even for people with type 2 diabetes mellitus who do not require intensive insulin therapy. Studies show that CGM improves glycemic control, reduces HbA1c, and helps detect postprandial hyperglycemia and hypoglycemia that may go unnoticed with conventional methods. In elderly patients, CGM provides a more comprehensive view of glycemic behavior, improving treatment adjustments and preventing complications.

However, challenges such as cost and information overload may limit the adoption of this technology, making it essential to provide adequate educational support to maximize its benefits.

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